Micrometer

The origin of Mitutoyo's trustworthy brand of small tool instruments

Digimatic Outside Micrometers SERIES 293

MeasurLink® ENABLED
Data Management Software by Mitutoyo

- Equipped with measurement data output function, it can form part of a statistical process control system or networked measurement system.
- Constant-force device: ratchet stop

293-582

- Interface Input Tools are available that enable the conversion of measurement data to keyboard signals that are then directly input to cells in off-the-shelf spreadsheet software such as Excel. (Refer to page A-5 for details.)
- Measuring faces: Carbide.

SPECIFICATIONS

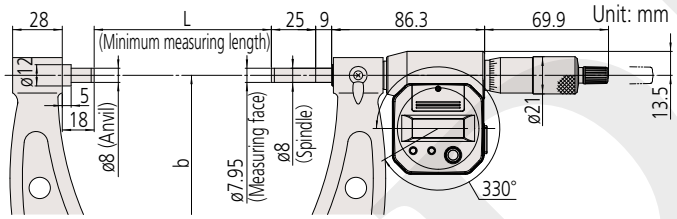
Metric

Order No.	Range (mm)	Maximum permissible error J_{MPE} (µm)	Flatness (µm)	Parallelism (µm)
293-582	300 - 325	±6	0.6	5
293-583	325 - 350			
293-584	350 - 375			
293-585	375 - 400	±7		6
293-586	400 - 425			
293-587	425 - 450			
293-588	450 - 475	±8		7
293-589	475 - 500			

Inch / Metric

Order No.	Range (in)	Maximum permissible error J_{MPE} (in)	Flatness (in)	Parallelism (in)
293-782	12 - 13	±0.0003	0.000024	0.0002
293-783	13 - 14			
293-784	14 - 15			
293-785	15 - 16	±0.00035		0.00024
293-786	16 - 17			
293-787	17 - 18			
293-788	18 - 19	±0.0004		0.00028
293-789	19 - 20			

DIMENSIONS



Range (mm)	L	b
300 - 325	300	187
325 - 350	325	199
350 - 375	350	212
375 - 400	375	224
400 - 425	400	236
425 - 450	425	248
450 - 475	450	261
475 - 500	475	273

SERIES 293 — Digimatic Outside Micrometers

- Extended battery life of approximately 2.4 years.
- Simple design and excluding the data output function keeps price economical.
- One switch operation (Origin Set) for easy use.
- Equipped with Ratchet Stop for constant measuring force.
- Measuring faces: Carbide.

293-821-30

SPECIFICATIONS

Metric — With ratchet stop/Measuring force: 5 to 10 N

Order No.	Range (mm)	Resolution (mm)	Maximum permissible error J_{MPE} (µm)
293-821-30	0 - 25	0.001	±2

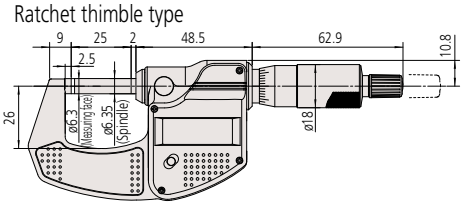
Inch / Metric — With ratchet stop/Measuring force: 5 to 10 N

Order No.	Range (in)	Resolution	Maximum permissible error J_{MPE} (in)
293-831-30	0 - 1	0.00005 in / 0.001 mm	±0.0001

Inch / Metric — With friction thimble/Measuring force: 5 to 10 N

Order No.	Range (in)	Resolution	Maximum permissible error J_{MPE} (in)
293-832-30	0 - 1	0.00005 in / 0.001 mm	±0.0001

DIMENSIONS



MeasurLink® ENABLED
Data Management Software by Mitutoyo

Products equipped with the measurement data output function can be connected to the measurement data network system MeasurLink® (refer to page A-25 for details).

Technical Data

- Resolution: 0.001 mm or 0.0001 in/0.001 mm
- Measuring force: 10 to 15 N
- SR44 (2 pcs.), **938882**, for initial operational checks (standard accessory)
- Battery life: Approx. 1.8 years under normal use
- Length standard: Electromagnetic rotary sensor
- Standard accessories: Reference bar, 1 pc. Spanner (**200154**), 1 pc.

Functions

Origin point setting (ABS measurement system):
Resets the ABS origin at the current spindle position to the minimum value of the measuring range and switches to ABS mode.
Zero-setting (INC measurement system):
A brief press on the ZERO/ABS button sets display to zero at the current spindle position and switches to the incremental (INC) measuring mode. A longer press resets to the ABS measuring mode.
Hold:
Pressing the HOLD button freezes the current value in the display. This function is useful for preserving a measurement in situations of poor visibility where the instrument must be moved away from the workpiece before the reading can be recorded.
Function lock:
This function allows the PRESET (origin point setting) function and the ZERO (zero-setting) function to be locked to prevent these points being reset accidentally.
Auto power ON / OFF:
The reading on the LCD disappears after this instrument is idle for about 20 minutes, but the reading and measurement mode are retained. Turning the spindle causes the reading to reappear.
Data output:
Models equipped with this function have an output port for transferring measurement data to a Statistical Process Control (SPC) system.
Error alarm:
In case of an overflow on the LCD or a computing error, an error message appears on the LCD, and the measuring function stops. This prevents an instrument from giving an erroneous reading. Also, when the battery voltage drops to a certain level, the low-battery-voltage alarm annunciator appears well before the micrometer becomes unusable.

Optional Accessories

- Connecting Cables
- Recommended cables:
  L-Type (does not interfere with operating the thimble.)
  1 m: **04AZB512**
  2 m: **04AZB513**
- Straight type (may interfere with operating the thimble.)
  1 m: **959149**
  2 m: **959150**

Refer to page A-21 for detailed information about recommended cables.

Mitutoyo guarantees the product quality. PROPRIETARY INSPECTION CERTIFICATE Mitutoyo guarantees the product quality.

An inspection certificate is supplied as standard. Refer to page U-9 for details.

Technical Data

- SR44 (1 pc.), **938882**, for initial operational checks (standard accessory)
- Length standard: Electromagnetic rotary sensor
- Battery life: Approx. 2.4 years under normal use
- Spanner (**301336**), 1 pc.

Functions

Zero-setting:
A brief press on the ORIGIN button sets display to zero at the current spindle position (zero-setting), which allows easy comparison measurement.
Auto power ON / OFF:
The reading on the LCD disappears after this instrument is idle for about 20 minutes, but the reading is retained. Turning the spindle causes the reading on the LCD to reappear.

Error alarm:
In case of an overflow on the LCD or a computing error, an error message appears on the LCD, and the measuring function stops. This prevents an instrument from giving an erroneous reading. Also, when the battery voltage drops to a certain level, the low-battery-voltage alarm annunciator appears well before the micrometer becomes unusable.

Micrometer

The origin of Mitutoyo's trustworthy brand of small tool instruments

High-Accuracy Digimatic Micrometer SERIES 293

MeasurLink® ENABLED
Data Management Software by Mitutoyo

- Enabling 0.1 µm resolution measurement, this micrometer is ideal for customers who need to make highly accurate measurements with a hand-held tool.
- The High-Accuracy Digimatic Micrometer utilizes Mitutoyo's innovative 0.1 µm resolution ABS (absolute) rotary sensor*1 and high-accuracy screw machining technology to reduce the Maximum permissible error to ±0.5 µm, delivering higher accuracy without sacrificing operability.
  *1 Patent pending in Japan, the United States of America, the European Union, and China.
- A highly rigid frame and high-performance constant-force mechanism*2 enable more stable measurement, while the clicks emitted while the workpiece is being measured assure the operator that measurement is proceeding normally.
  *2 Patent pending in Japan, the United States of America, the European Union, and China.
- Body heat transferred to the instrument is reduced by a (removable) heat shield, minimizing the error caused by thermal expansion of the frame when performing handheld measurements.
- The ABS (absolute) rotary sensor also eliminates the need to perform origin setting each time the power is turned on, letting you start measuring straight away. With no possibility of overspeed errors, the High-Accuracy Digimatic Micrometer also delivers a higher level of reliability.
- The High-Accuracy Digimatic Micrometer has a range of features to enable flexible measurement including switchable resolution (0.0001 mm/0.0005 mm), function lock and preset.
- Carbide-tipped measuring faces

Function lock

293-100-10

MeasurLink® ENABLED
Data Management Software by Mitutoyo
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PROPRIETARY INSPECTION CERTIFICATE
Mitutoyo guarantees the product quality. Mitutoyo guarantees the product quality.
An inspection certificate is supplied as standard. Refer to page U-9 for details.

ABSOLUTE™

Functions

Preset (ABS measurement system):
The measurement origin can be preset to any value within the display range for convenience in measuring.
Zero-setting (INC measurement system):
The display can be zeroed at any position of the spindle, making comparison measurement easier. Returning to the absolute-measurement mode is easily accomplished.
Hold:
The displayed value is held while the spindle is withdrawn and the micrometer moved so that the display can be read at the operator's convenience. After cancelling the hold, the instrument returns to the previous measuring mode (absolute or incremental).
Resolution switching:
The resolution of the display can be switched. If 0.1 µm measurement is not required, the resolution can be switched to 0.5 µm.
Function lock:
Functions such as preset or zero-set can be locked to avoid inadvertently changing the origin position.
On/off:
The power can be turned off after measurement is complete. Even after the power is turned off, the origin or last zero-set position remains in the memory.
Auto power off:
Even if the power is left on, the power turns off automatically if the micrometer is not used within a 20-minute period.
Measurement data output:
Measurement data can be output, allowing easy incorporation of this instrument into a statistical process control or measurement system.
Error alarm:
In the unlikely event of a display overflow or calculation error, an error message is displayed and measurement stops. Measurement cannot continue until the error is corrected.
Also, if the battery voltage drops below a certain point, the battery indicator will turn on before measurement becomes impossible, warning the user that the battery needs to be replaced.

Standard Accessories

Heat shield (**04AAB969A**: **293-100-10**
04AAB969B: **293-130-10**) ×1
Lithium battery CR2032 (1 pc.),
for initial operational checks (standard accessory)
Spanner (**200877**) ×1
Screwdriver (**04AAB985**) ×1
Cleaning paper for measuring faces
Inspection certificate

With heat shield attached

Heat shield

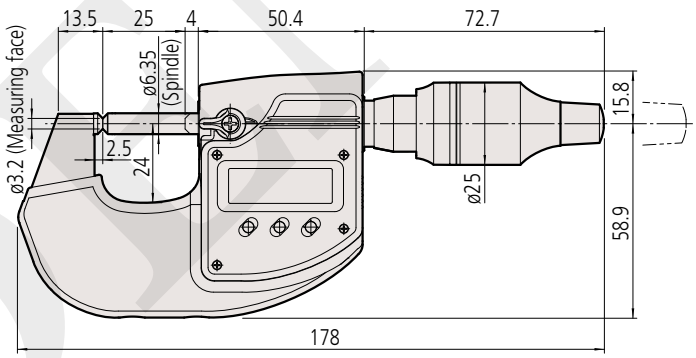
Optional Accessories

- Connecting cables with output switch
  1 m: **05CZA662**
  2 m: **05CZA663**
- USB Input Tool Direct
  USB-ITN-B (2 m): **06AFM380B**
- Connecting cables for **U-WAVE-T**
  160 mm: **02AZD790B**
  For foot switch: **02AZE140B**
  Refer to page A-21 for details.
- Cleaning paper for measuring faces (1,000 sheets):
  04AZB581

Recommended micrometer stand: **156-101-10**

DIMENSIONS

Unit: mm



SPECIFICATIONS

	Metric	Inch/Metric
Order No.	**293-100-10**	**293-130-10**
Measuring range	0 – 25 mm	0 – 1 in
Resolution	0.0001 mm/0.0005 mm (switchable)	0.000005 in/0.00002 in 0.0001 mm/0.0005 mm (switchable)
Maximum permissible error J_{MPE}	±0.5 µm	±0.00002 in
Flatness/Parallelism	0.3 µm/0.6 µm	0.000012 in/0.000024 in
Measuring surface	ø3.2 mm	
Measuring force	7 to 9 N	
Measuring system	Electromagnetic induction type ABS rotary sensor	
Mass	400 g (440 g with heat shield attached)	
Power supply	Lithium battery (CR2032) ×1	
Battery life	Approx. two years when used under normal conditions	

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